

CLAIMS:

1. An intubating laryngeal mask airway device comprising:

an airway tube having a fixed curve of substantially constant radius in a first geometric plane, the fixed curve is configured to conform to an anatomical curve in a patient between a proximal end at approximately the location of a hard palate and a distal end at approximately a laryngeal inlet, said fixed curve having an arc of an angular extent between 100° and 145° , said airway tube is adapted to be attached to an air source outside the patient; and,

a mask structure attached to the distal end of the airway tube, said mask structure includes a backing plate which has a generally elliptical periphery in essentially a second geometric plane which is perpendicular to said first geometric plane and that is adapted to provide an air tight seal around the laryngeal inlet, said attachment between the mask structure and airway tube defines a first acute angle, wherein the airway tube defines a lumen adapted to provide air from the air source to the laryngeal inlet.

2. The device of claim 1, in which said angular extent is in the range of $130^{\circ} \pm 5^{\circ}$.

3. The device of claim 1 in which said mask includes a ramp in the path of advancing intubation beyond the distal end of said tube, said ramp being adapted to substantially maintain an angle of intubation advance toward a glottic opening to facilitate entrance of an endotracheal tube advancing through the opening of the lumen of the device into the patient's glottic aperture.

4. The device of claim 3, in which said ramp is of generally V-section, said ramp having opposing sidewalls that diverge symmetrically with respect to said first geometric plane.

5. The device of claim 4, in which said V-section expands from substantially a single point at exit from the distal end of the curved airway tube, with ramp sidewalls diverging from a central line of symmetry, wherein the central line of symmetry includes said point and is substantially tangent to an outer-radius curvature of the distal end of the bore of said tube.

6. The device of claim 5, wherein the included divergence angle between sidewalls of said ramps is in the range of 150° to 165°.

7. An intubating laryngeal mask airway device comprising:

an airway tube having a fixed curve of substantially constant radius, the fixed curve is configured to conform to an anatomical curve in a patient between a proximal end at approximately the location of a hard palate and a distal end at approximately a laryngeal inlet, said fixed curve having an arc of an angular extent between 100° and 145°, said airway tube is adapted to be attached to an air source outside the patient; and,

a mask structure attached to the distal end of the airway tube, said mask structure includes a backing plate which has a generally elliptical periphery that is adapted to provide an air tight seal around the laryngeal inlet, said attachment between the mask structure and airway tube defines an acute angle, wherein the airway tube defines a lumen adapted to provide air from the air source to the laryngeal inlet,

wherein said mask includes a compliantly hinged tongue that is normally disposed diametrically across the distal end of said path and is adapted to deflect the epiglottis upon advance of intubation beyond said distal end.

8. The device of claim 1, wherein the device is further defined by the distal end of said tube having a telescoping fit to the airway passage of said backing plate, and in which said distal end is truncated at a second acute angle to said second geometric plane, the direction of said second acute angle with respect to said second geometric plane being opposite to the direction of said first acute angle.

9. The device of claim 1, in which the proximal-end portion of said tube has at least a portion that is straight.

10. The device of claim 1 in which said tube has an outer-surface cladding of yieldable elastomeric material.

11. The device of claim 1, in which an inflatable ring continuously surrounding and connected to the periphery of said backing plate is adapted for sealing conformance of said mask structure to the laryngeal inlet.

12. The device of claim 1, in which said fixed curve includes an intermediate locale for which a geometric tangent to said fixed curve is substantially parallel to adjacent patient backbone alignment, and in which an otherwise continuous arcuate development of said fixed curve is divided into proximal and distal regions which are integrally and tangentially formed with a substantially straight intermediate region of predetermined extent that is substantially parallel to said adjacent patient backbone alignment.

13. The device of claim 12, in which said proximal region is arcuate about a first center in said first geometric plane and said distal region is arcuate about a second center in said first geometric plane, said centers being spaced from each other on a geometric alignment which is substantially parallel to said substantially straight intermediate region.

14. The device of claim 13, in which said proximal and distal regions are of substantially the same radius about their respective centers.

15. An intubating laryngeal-mask airway device, comprising an airway tube having a fixed curve of substantially constant radius in a first geometric plane, the fixed curve is configured to conform to an anatomical curve in a patient between a proximal end at approximately the location of a hard palate and a distal end at approximately a laryngeal inlet,

said fixed curve having an arc of an angular extent between 100° and 145°, and mask structure of yieldable material at said distal limit, said rigid tube including a proximal end portion integrally formed with and tangentially related to the proximal limit of said fixed curve;

said mask structure comprising a backing plate having a generally elliptical periphery in essentially a second geometric plane which is perpendicular to said first geometric plane, said periphery being adapted for sealing conformance to the laryngeal inlet, said mask structure having an airway passage through said backing plate (i) in said first geometric plane and (ii) at a first acute angle to said second geometric plane and (iii) connected to the distal limit of said tube, said mask structure including a ramp in the path of advancing intubation beyond the distal limit of said tube, said ramp being adapted to centrally stabilize intubation upon exit from the distal end of the curved portion of said rigid airway tube and in a direction toward the glottic opening, the included angle of intubation direction, upon exit from said ramp, being in the range of $130^{\circ} \pm 5^{\circ}$ with respect to the orientation of said tangentially related proximal end portion.

16. The device of claim 15, in which said mask includes a compliantly hinged tongue that is normally disposed diametrically across the distal end of said path and is adapted to deflect the epiglottis upon advance of intubation beyond said distal end.

17. The device of claim 15, in which the distal end of said tube has a telescoping fit to the airway passage of said backing plate, and in which said distal end is truncated at a second acute angle to said second geometric plane, the direction of said second acute angle with respect to said second geometric plane being opposite to the direction of said first acute angle with respect to said second geometric plane.

18. The device of claim 15, in which the tangentially related proximal-end portion of said tube is straight.

19. The device of claim 15, in which said tube has an outer-surface cladding of yieldable elastomeric material.

20. The device of claim 15, in which an inflatable ring continuously surrounding and connected to the periphery of said backing plate is adapted for sealing conformance of said mask structure to the laryngeal inlet.

21. An intubating laryngeal mask airway device including a continuous lumen for ventilating service to a patient's laryngeal inlet, extending from a proximal end to a distal end, the device including a proximal end portion extending from the proximal end of the device to a first location, the first location being closer to the proximal end of the device than to the distal end, a rigid airway tube extending from the first location to a second location, the second location being located between the first location and the distal end of the device and being closer to the distal end of the device than to the proximal end, the airway tube having a fixed curve of substantially constant radius between said first location and said second location, said fixed curve having an arc of an angular extent between 100° and 145° , and a laryngeal mask extending from the second location to the distal end of the device, said laryngeal mask having a generally elliptical periphery adapted for sealed engagement to the patient's laryngeal inlet, the periphery in a plane perpendicular to the fixed curve of the airway tube.

22. The device of claim 21, wherein the angular extent between the first location and the second location is in the range of $130^{\circ} \pm 5^{\circ}$.

23. The device of claim 21, wherein the first location is adjacent the longitudinal center of the patient's hard palate.

24. The device of claim 21, wherein the second location is adjacent the patient's glottic aperture.

25. The device of claim 21, wherein the laryngeal mask is of yieldable material.

26. The device of claim 21, wherein the device is adapted to telescopically receive an endotracheal tube.

27. The device of claim 21, wherein the laryngeal mask further includes a ramp in the lumen adapted to facilitate entrance of an endotracheal tube advancing through the opening of the lumen of the device into the patient's glottic aperture.

28. The device of claim 27, wherein the ramp includes a groove adapted to guide and support the endotracheal tube.

29. An intubating laryngeal mask airway device including a continuous lumen for ventilating service to a patient's laryngeal inlet, extending from a proximal end to a distal end, the device including a proximal end portion extending from the proximal end of the device to a first location, the first location being closer to the proximal end of the device than to the distal end, a rigid airway tube extending from the first location to a second location, the second location being located between the first location and the distal end of the device and being closer to the distal end of the device than to the proximal end, the airway tube being curved along a fixed curve between said first location and said second location, said fixed curve having an arc of an angular extent between 100° and 145°, and a laryngeal mask extending from the second location to the distal end of the device, said laryngeal mask having a generally elliptical periphery adapted for sealed engagement to the patient's laryngeal inlet, the periphery in a plane perpendicular to the fixed curve of the airway tube,

wherein the laryngeal mask further includes a ramp in the lumen adapted to facilitate entrance of an endotracheal tube advancing through the opening of the lumen of the device into the patient's glottic aperture, the ramp further including a groove adapted to guide and support the endotracheal tube,

wherein the laryngeal mask further includes a tongue formation having a diameter that is smaller than the diameter of the lumen, the tongue formation being hinged onto the backing plate of the laryngeal mask construction.

30. The device of claim 29, wherein the advancement of the endotracheal tube deflects the tongue formation.

31. The device of claim 21, wherein the airway tube is constructed of stainless steel.

32. The device of claim 21, wherein the airway tube is coated with an elastomeric material.

33. The device of claim 21, wherein the fixed curve is circular with a substantially constant radius.

34. The device of claim 21, wherein the fixed curve is elliptical with two radii, a line connecting the centers of the two radii being essentially parallel to the alignment of the patient's vertebrae.

35. The device of claim 21, wherein the lumen has a 13 mm minimum diameter.

36. An intubating laryngeal mask airway device comprising:

an airway tube having a fixed curve of substantially constant radius, said fixed curve configured to conform to an anatomical curve in a patient between a proximal end at approximately the location of a hard palate and a distal end at approximately a laryngeal inlet, said fixed curve having an arc of an angular extent between 100° and 145°, said airway tube adapted to be attached to an air source outside the patient; and

an inflatable mask structure attached to the distal end of the airway tube, said mask structure providing an air tight seal around the laryngeal inlet when inflated, the airway tube defining a lumen adapted to provide air from the air source to the laryngeal inlet.

37. An intubating laryngeal mask airway device comprising:

an airway tube having a fixed curve, the fixed curve is configured to conform to an anatomical curve in a patient between a proximal end at approximately the location of a hard palate and a distal end at approximately a laryngeal inlet, said airway tube adapted to be attached to an air source outside the patient;

said fixed curve including an intermediate locale for which a geometric tangent to said fixed curve is substantially parallel to adjacent patient backbone alignment, and in which an otherwise continuous arcuate development of said fixed curve is divided into proximal and distal regions which are integrally and tangentially formed with a substantially straight intermediate region of predetermined extent that is substantially parallel to said adjacent patient backbone alignment, said proximal region having a first arc of a first angular extent and said distal region having a second arc of a second angular extent, the sum of said first angular extent and said second angular extent being between 100° and 145°; and

an inflatable mask structure attached to the distal end of the airway tube, said mask structure providing an air tight seal around the laryngeal inlet when inflated, the airway tube defining a lumen adapted to provide air from the air source to the laryngeal inlet.

38. The device of claim 37, in which said proximal region is arcuate about a first center and said distal region is arcuate about a second center, said centers being spaced from each other on a geometric alignment which is substantially parallel to said substantially straight intermediate region.

39. The device of claim 38, in which said proximal and distal regions are of substantially the same radius about their respective centers.